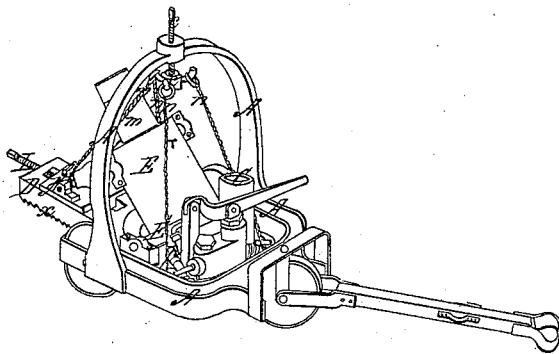
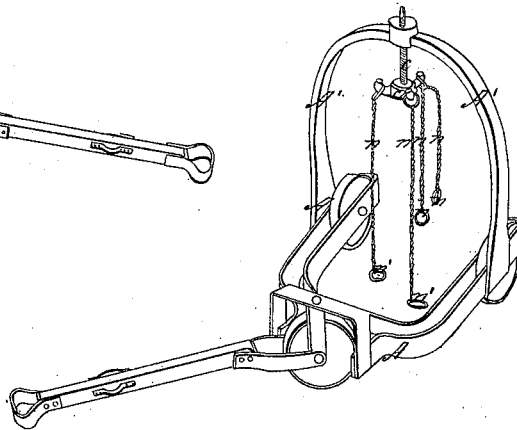


*J. Ryan,*  
*Hydraulic Jack,*  
*N<sup>o</sup> 52,210.      Patented Jan. 23, 1866.*

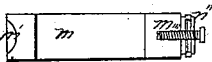
*Fig. 1.*



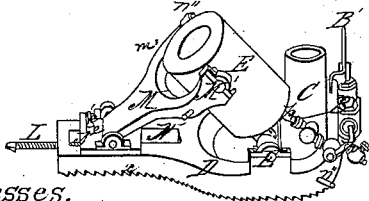
*Fig. 2.*



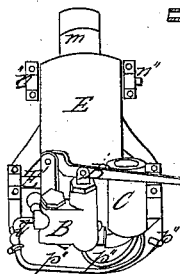
*Fig. 6*



*Fig. 3.*



*Fig. 4.*



*Fig. 5*



*Witnesses.*

*M. Randolph*  
*W. W. Hall*

*Inventor.*

*Joseph Ryan*

# UNITED STATES PATENT OFFICE.

JOSEPH RYAN, OF ST. LOUIS, MISSOURI.

## IMPROVEMENT IN HYDRAULIC JACKS.

Specification forming part of Letters Patent No. 52,210, dated January 23, 1866.

*To all whom it may concern:*

Be it known that I, JOSEPH RYAN, of the city and county of St. Louis, and State of Missouri, have invented a new and useful Improvement in Angle Hydraulic Jacks; and I hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, and forming part of this specification, in which—

Figure 1 is a perspective view of one of the jacks and its transporting-carriage. Fig. 2 is a perspective view of the transporting-carriage. Fig. 3 is a perspective view of the jack separated from its transporting-carriage. Fig. 4 is an end elevation of the jack separated from its carriage. Fig. 5 is a sectional view of the pipe connecting the reservoir for the fluid used with the cylinder of the jack. Fig. 6 is a sectional view of the plunger of the jack.

The invention relates to so constructing a hydraulic jack that it can be so adjusted that the longitudinal axis of the plunger will form any desired angle of inclination with the horizon, which change of direction of the longitudinal axis of the plunger and cylinder can be accomplished without injuring the joints of the pipe connecting the cylinder with the reservoir, and the jack can be subjected to the greatest pressure it is possible to produce at any angle of inclination with the base or fulcrum upon which it rests without sliding back from the work it is intended to perform.

My improved jack consists of a metal cylinder, E, and piston-rod or plunger *m*, made of proper strength to resist and support heavy weights. This cylinder rests upon and is secured firmly at its base to a stout rocker-shaft, E', which turns freely in a semicircular bed or groove embracing its entire length, and formed in a supporting-block upon a heavy bed plate or frame, D, constituting the base of the machine. The shaft E' is confined in its bed by collars at each end thereof.

The base D of the jack is prolonged forward, as illustrated in the drawings, and is slotted or otherwise so constructed as to form

horizontal ways for a sliding carriage, N. This sliding carriage consists of a metallic plate resting upon the ways formed by the upper surface of the base D, and having a lug projecting from its under side, so as to fit in the slot between the ways. A second plate, placed beneath the ways or in a recess cut on the under side thereof, rests against the lower face of the lug or projection from the upper plate, and is held there by bolts *e* passing through apertures in the carriage and fastened by wedge-shaped pins *e'* passing through slots in their upper ends. These bolts *e* thus tie and clamp the carriage upon the ways, either locking it firmly down in place or leaving it free to slide thereon as the wedge-pins *e'* are driven tight or left loose. Motion is imparted to this carriage N by means of a screw, L, passing centrally through a threaded aperture in the forward end of the base D, and secured by a loose joint to the front end of the carriage N.

The cylinder E, inclined toward the front, is supported by a strong forked brace, M, whose upper arms form bearings to receive stout pivots projecting from opposite points in the cylinder, and which are secured in said bearings by suitable collars or clamps. The lower end of the brace rests upon the carriage, and is pivoted thereto between two lugs projecting from its upper surface, as shown in the drawings. Thus, by sliding the carriage N backward or forward upon the ways through the medium of its operating-screw L, the brace M, pivoted both to the carriage and the cylinder, will elevate or depress the upper end of the latter, so as to vary its inclination to any desired angle, while, by locking the carriage by means of the wedge-pins *e'*, it may be fully braced at such desired angle and be at once ready for operation.

The base or bed-frame D of the machine is prevented from sliding or slipping back under the pressure which may be exerted thereon when at work by means of corrugations cut over its entire lower face, the angles therein being made quite acute and set back so as to point more or less toward the rear.

The cylinder E is connected with a suitable force-pump, B, placed upon the rear end of the base D by means of a pipe, *p*, having a

series of socket-joints,  $p'$ , which renders it so far flexible as that it will readily adjust itself to the varying inclinations of the cylinder.

The pump is supplied from a reservoir, C, also placed upon the base D, by its side. This reservoir is connected directly with the cylinder E by means of a second jointed pipe,  $p''$ , and closed by a suitable stop-cock,  $l$ . By opening this cock the fluid in the jack is allowed to escape into the reservoir, and the plunger or piston  $m$  of the jack thus permitted to fall. This piston or plunger  $m$  of the cylinder E may be cheaply made of wood, its ends, however, being capped with metal, as shown in Fig. 6. Its lower end is made to form a close joint with the interior of the cylinder by means of suitable packing held in place by a metal ring,  $m''$ , whose edges are beveled, and which is secured by a set-screw,  $m'''$ , all as illustrated in Fig. 6 of the drawings.

My improved jack, with its pump and reservoir, may be readily transported from place to place by means of a truck or carriage, A A, Fig. 2, consisting of a stout frame, so constructed with its rear end open so that it may run back and inclose the jack, and having a suitable upright structure, A' A', thereon, from which the machine may be suspended by means of chains  $n n n n$ , operated by a screw, C, in the center of the structure, as illustrated in Fig. 1 of the drawings.

Having thus fully described my improved hydraulic jack, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The combination of a hydraulic cylinder, E, with a suitable base or bed plate, D, by means of a hinged support, E', substantially in the manner and for the purpose herein set forth.

2. The combination of an adjustable brace, M, with a hydraulic cylinder, E, and base or supporting-frame D, for the purpose of staying the cylinder at any desired angle of inclination, substantially in the manner herein described.

3. The combination of a suitable force-pump, B, reservoir C, and hydraulic cylinder E with each other and with a single supporting-frame or base, D, substantially in the manner and for the purpose herein set forth.

4. In combining and connecting a suitable force-pump, B, with an adjustable hydraulic cylinder, E, by means of a jointed flexible pipe,  $p$ , substantially in the manner and for the purpose herein set forth.

JOSEPH RYAN.

Witnesses:

M. RANDOLPH,  
WM. W. HALL.